

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 63143	FOR FURTHER ACTION		See Form PCT/IPEA/416																								
International application No. PCT/EP2004/051400	International filing date (day/month/year) 07.07.2004	Priority date (day/month/year) 17.07.2003																									
International Patent Classification (IPC) or national classification and IPC H01F38/14																											
Applicant THALES UK PLC et al.																											
<ol style="list-style-type: none"> 1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of 9 sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: <ol style="list-style-type: none"> a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows: <ul style="list-style-type: none"> <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box. b. <input type="checkbox"/> (sent to the International Bureau only) a total of (Indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions). 																											
<ol style="list-style-type: none"> 4. This report contains indications relating to the following items: <table style="width: 100%; border: none;"> <tr> <td style="width: 10%;"><input checked="" type="checkbox"/></td> <td style="width: 10%;">Box No. I</td> <td>Basis of the opinion</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> 				<input checked="" type="checkbox"/>	Box No. I	Basis of the opinion	<input type="checkbox"/>	Box No. II	Priority	<input checked="" type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
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Date of submission of the demand 17.02.2005		Date of completion of this report 11.01.2006																									
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer Kardinal, I Telephone No. +49 89 2399-																									



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/EP2004/051400

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-18 as originally filed

Claims, Numbers

1-23 as originally filed

Drawings, Sheets

1/8-8/8 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 23

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 23 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See separate sheet for further details

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	
	No: Claims	1-3,11,17-22
Inventive step (IS)	Yes: Claims	
	No: Claims	1-3,9,10,11,13-15,17-19
Industrial applicability (IA)	Yes: Claims	1-22
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V.

1. The following documents are referred to in this communication:

D1: US 4 303 902 A (LESSTER LABAN E ET AL) 1 December 1981 (1981-12-01)
D2: US 6 476 520 B1 (LANG RAINER ET AL) 5 November 2002 (2002-11-05)
D3: US 4 144 485 A (AKITA SIGEYUKI) 13 March 1979 (1979-03-13)
D4: EP 0 394 714 A (TEXAS INSTRUMENTS DEUTSCHLAND) 31 October 1990 (1990-10-31)
D5: US-A-4 876 535 (BALLMER HORST ET AL) 24 October 1989 (1989-10-24)
D6: US-B-6 319 0311 (GREENSTEIN ALAN) 20 November 2001 (2001-11-20)
D7: EP-A-1 077 511 (SUMITOMO WIRING SYSTEMS) 21 February 2001 (2001-02-21)

2. INDEPENDENT CLAIMS 1, 17-20

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document **D1** discloses (the references in parenthesis applying to this document): A two-part electrical connector (Fig. 7: 80), said connector having a first part being a tongue portion (Fig. 7: 82) having a base (Fig. 7: 90) and a tongue (ref. 86, 91, 95, 96, 96) extending longitudinally therefrom; a second part being a socket portion (Fig. 7: 83) having a base (see Fig. 7 right hand side of connector portion 83) and walls (inner walls of portions 160, 161, 162) extending therefrom defining a socket for slidably receiving the tongue, the tongue portion and socket portion having locking means (ref. 184, 186) to permit releasable mutual engagement, said locking means including a locking member moveable between a first position in which the tongue is held in the socket and a second position in which the tongue is removable from the socket (see Fig. 7 and 8 in connection with description col. 5, l. 54 to col. 6, l. 12); a primary coupling element (ref. 86) located in the tongue; and a secondary coupling element (ref. 87) located in at least one of the socket walls, which elements provide a contact-less electromagnetic coupling when the tongue is engaged in the socket (see abstract).

- 2.2 The subject-matter of claim 1 is also not new in the sense of Article 33(2) PCT in

view of document **D2** which discloses similarly to **D1** a contact-less two-part electrical connector for transmission of energy and/or data signals of the type specified in claim 1, see in particular **D2**, Fig. 1 and 3 and related description col. 2, l. 66 to col. 7, l. 58: socket portion 23 and tongue portion 24 locked to each other via a thread coupling 6, 12, 13 (with other couplings possible: see col. 7, l. 47-49).

- 2.3 The subject-matter of claim 1 is also not new in the sense of Article 33(2) PCT vis-à-vis document **D3**, which also discloses a contact-less two-part electrical connector having coaxially arranged primary and secondary inductors in the two connector halves which may be locked to each other via releasable locking means in the form of snap fits or latches, see in particular **D3**, abstract, Fig. 1-3 and related description col. 1, l. 64 to col. 2, l. 35.
- 2.4 It is also noted that the present application does also not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

Document **D4** discloses with reference to the embodiment of Fig. 3a and 3b (see also related description of **D4**, col. 5, l. 14 to col. 6, l. 15) all the features of present claim 1 relating to the tongue and socket connector arrangement having contact-less electrical signal transmission. In connection with this embodiment a "releasable" locking means is not explicitly mentioned in **D4**.

The problem to be solved by the invention set forth in present claim 1 can therefore be regarded in the provision of an alternative locking means to the snap fit lock (56, 58) of Fig. 3a, 3b in **D4**.

To replace a connector locking means by other widely known releasable locking means is however common knowledge in the concerned technical field. Even in **D4** itself the man skilled in the art is provided with an alternative locking means in the form of a thread nut coupling or a bayonet coupling as shown in Fig. 2 or Fig. 4 of **D4**, which both represent releasable locking structures.

Thus, the subject matter of claim 1 can not be regarded as providing an inventive step in accordance with Art. 33(3) PCT.

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- 2.5 The subject matter of claim 17 relates to the tongue portion alone and is not new in the sense of Art. 33(2) PCT for the same reasons as set forth referring to the subject matter of claim 1.
- 2.6 The subject matter of claim 18 relates to the socket portion alone and is not new in the sense of Art. 33(2) PCT for the same reasons as set forth referring to the subject matter of claim 1.
- 2.7 The subject matter of claim 19 relates to the use of the connector of claim 1 and is not new in the sense of Art. 33(2) PCT for the same reasons as set forth referring to the subject matter of claim 1. All of the cited documents **D1** to **D4** use the two-part electrical connector for the transmission of electrical signals.
- 2.8 The method of claim 20 has been already employed for the two-part contact-less electrical connectors as described in documents **D1** (see Fig. 5 and 6 and related description col. 3, l. 39 to 49) and **D2** (see Fig. 3 and related description col. 9, l. 41-59) and therefore the subject matter of claim 20 is not new in the sense of Art. 33(2) PCT.
- 2.9 None of the documents discloses the combination of the two-part non-conductive connector with a webbing strap containing electrical wires as set forth in claim 16.
- 3. DEPENDENT CLAIMS 2, 3, 9-11, 13-15, 21, 22**
Dependent claims 2, 3, 9-11, 13-15, 21, and 22 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step (Article 33(2) and (3) PCT).
- 3.1 The subject-matter of claims 2 and 3 is also disclosed in documents **D1** to **D4** as all of these documents relate to inductive contact-less couplings in which the primary and secondary inductors are arranged on side walls of tongue and socket portions of the coupling.
- 3.2 With reference to the capacitive coupling as specified by the features of claims 9 and 10 it is referred to documents **D3** (see Fig. 7 and related description) and **D5** (see abstract and Fig. 1) which both describe inductive and capacitive coupling as known alternatives in contact-less coupling. The skilled person would therefore

regard it as a normal design option to include this feature in the contact-less two-part connector described in one of the documents **D1** to **D4** in order to provide capacitive coupling in case it seems desirable.

- 3.3 The subject matter of claim 11 is already disclosed by the teaching of **D1**, see apertures (210, 211) in the shroud (110) of Fig. 7 and the corresponding apertures (not provided with reference signs) in the socket portion (83) and related description col. 6, l. 13 to 39.

Furthermore, attention is drawn to document **D7** which shows a two-part electrical connector with an aperture of the type set forth in claim 11 through which dirt can escape from the socket (see **D1**, Fig. 1 to 3 and related description, col. 5, l. 62 to col. 6, l. 11). It would be obvious to the person skilled in the art, namely when the same result is to be achieved, to apply these features with corresponding effect to a two-part connector according to one of the documents **D2** to **D4**, thereby arriving at a contact-less connector according to claim 11.

- 3.4 Claims 13 to 15 relate to particular features of the locking means which may be a resilient latch cooperating with a detent (claim 13), whereby the latch is preferably located on the tongue portion and the detent is preferably located in the socket portion (claim 14), and wherein preferably two latches spaced laterally are located on the tongue (claim 15). Such a locking means is known in the field of electrical connectors, see for example document **D7**, abstract and Fig. 1-9. It would be obvious to the person skilled in the art, namely when the same result is to be achieved, to apply these features with corresponding effect to a connector according to any of the documents **D1** to **D4**, thereby arriving at a two-part connector according to claims 13 to 15.

- 3.5 The dependent method claims 21 and 22 relate to the particular way of detecting the mated or unmated condition of the two-part connector by way of impedance change (claim 21) or phase change (claim 22). Of course, by having an inductive or capacitive coupling method, the change of impedance always involves a change of the relative phase between current and voltage. In document **D1** both, impedance change and/or phase change are used via their direct influence on tuning of the connector to detect the mated/unmated condition of the two-part coupling (see Fig. 5 and 6 and related description col. 3, l. 39 to 49). Thus, the subject matter of claims 21 or 22 appears not to involve an inventive step in the

sense of Art. 33(3) PCT.

4. DEPENDENT CLAIMS 4 to 8, and 12

The combination of the features of dependent claims 4 (with claims 5 to 8 dependent thereon), 12, and 16 are neither known from, nor rendered obvious by, the available prior art. The reasons are as follows:

- 4.1 Non of the documents shows the particular arrangement of the core of the secondary inductor as set forth in present dependent claim 4 which would allow to design a flat and compact two-part connector.
 - 4.2 Non of the documents shows the particular arrangement of internal baffles of the socket portion as set forth in claim 12 which improve the self-cleaning capability of the connector.
- 5. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).**

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Claim 23 contains a reference to the drawings and the whole description only without specifying any particular technical feature. According to Rule 6.2(a) PCT, claims should not contain such references except where absolutely necessary, which is not the case here.